

**IN THE UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK**

	X
In re:	: Chapter 11
	:
PURDUE PHARMA L.P., <i>et al.</i> ,	: Bankruptcy Case No. 19-23649 (RDD)
	:
Debtors.	: (Jointly Administered)
	:

**DECLARATION OF JESSICA B. HOREWITZ, PH.D.
IN SUPPORT OF THE AD HOC COMMITTEE’S REPLY TO PLAN OBJECTIONS
AND IN SUPPORT OF PLAN CONFIRMATION**

COMMONWEALTH OF VIRGINIA

COUNTY OF FAIRFAX

I, Jessica B. Horewitz, Ph.D., pursuant to 28 U.S.C. §1746, hereby declare that the following is true to the best of my knowledge, information, and belief:

1. I am over the age of eighteen (18) years and am otherwise competent and capable of making this declaration. This declaration is based on my own personal knowledge of the facts stated herein.

2. I submit this declaration, in lieu of direct testimony, on behalf of the Ad Hoc Committee of Governmental and Other Contingent Litigation Claimants (the “Ad Hoc Committee”) and in support of confirmation of the Chapter 11 plan (the “Plan”) proposed by the above-captioned debtors and debtors-in-possession (the “Debtors” or “Purdue”).

3. I serve as President of Gnarus Advisors, LLC, a private economic and analytics consulting firm. I have personal knowledge of the facts recited below, and if called upon to testify about them under oath would do so competently.

4. I have been retained, and have testified, in numerous liability estimation matters. For more than twenty-five years, I have used analytical and statistical tools in a variety of settings

including bankruptcy, complex damage calculations, economic forecasting, statistical analysis, and cash-flow analysis.

5. I was retained as an expert by the Ad Hoc Committee in the above captioned matter to evaluate the extent to which the liabilities of Debtors arising out of or in connection with Opioid-Related Activities (“Opioid Claims”)¹ exceed the value of the assets being contributed to fund the Plan and satisfy the Opioid Claims.²

6. The purpose of my evaluation was to support certain findings regarding confirmation of the Plan.

7. I submitted my evaluation to the Ad Hoc Committee on June 24, 2021 (“Report”) which I understand was served, pursuant to the Second Amended Order Granting Debtors’ Motion for Order Establishing Confirmation Schedule and Protocols [Docket No. 2989], that same day. I also understand that a courtesy copy of my Report was provided to the Debtors’ insurers on July 1, 2021.

8. Attached as **Exhibit A** is a true and correct copy of the Report I prepared in this matter, titled “Purdue Pharma Liability Analysis,” dated June 24, 2021, which contains my expert opinion.

9. As shown in Exhibit A, when I prepared my Report for the Ad Hoc Committee, I served as a Senior Vice President of the Litigation and Expert Services practice at Nathan Associates, Inc., a private consulting firm. Effective August 1, 2021, I joined Gnarus Advisors, LLC.

¹ For purposes of this Declaration, “Opioid Claims” shall refer to Claims in Classes 3, 4, 5, 6, 7, 8, 9, 10(a) and 10(b) under the Plan.

² All capitalized terms herein shall have the meanings ascribed to them in the Plan unless otherwise noted.

10. I understood from my review of documents provided by Gilbert LLP, counsel to the Ad Hoc Committee (“Counsel”), that the Debtors are in bankruptcy and that they filed the aforementioned Plan on June 3, 2021. The Plan filed on June 3, 2021 was the then-current Plan at the time I prepared my Report. I have since reviewed the now-current Plan, as of the date of this declaration, the Sixth Amended Plan filed on July 14, 2021. I note that the Shareholder Settlement Amount in the Sixth Amended Plan increased from \$4.275 billion to \$4.325 billion. The table below summarizes the results as found in my June 24, 2021 report, which adjusted the \$4.275 billion Shareholder Settlement Amount to account for the DOJ paid satisfaction resulting in \$4.245 billion.³

Results as in June 24, 2021 Horewitz Report		
Assets	DOJ Ratio	Minimum Opioid Claim Liability
\$10.394 billion	0.473%	\$2.198 trillion
\$4.245 billion		\$897.676 billion
\$20.788 billion		\$4.396 trillion
\$10.394 billion	0.946%	\$1.099 trillion
	0.237%	\$4.396 trillion
\$4.245 billion	0.237%	\$1.795 trillion
	0.946%	\$448.838 billion
\$20.788 billion	0.237%	\$8.792 trillion
	0.946%	\$2.198 trillion

³ While reviewing my Report in preparation for this Declaration, I noted a typographical error in the table and concluding paragraph on page 11. The Lower Bound Value of Assets used for the calculations shown was \$4.245 billion, as otherwise described in the Report, not \$4.275 billion.

The increase in Shareholder Settlement Amount impacts the results in my Report. I re-calculate those results using the updated Shareholder Settlement Amount and summarize those results in the table below.

Results Adjusted for Updated Asset Value		
Assets	DOJ Ratio	Minimum Opioid Claim Liability
\$10.444 billion	0.473%	\$2.209 trillion
\$4.295 billion		\$908.249 billion
\$20.888 billion		\$4.417 trillion
\$10.444 billion	0.946%	\$1.104 trillion
	0.237%	\$4.417 trillion
\$4.295 billion	0.237%	\$1.816 trillion
	0.946%	\$454.125 billion
\$20.888 billion	0.237%	\$8.834 trillion
	0.946%	\$2.209 trillion

Using the revised Shareholder Settlement Amount changes the Minimum Opioid Claim Liability range provided in my Report from \$448.838 billion - \$8.792 trillion to \$454.125 billion - \$8.834 trillion, which continues to exceed the Assets by many multiples (approximately 100-400 times over). I have therefore confirmed that the conclusions set forth in my Report have not materially changed.

11. Section 5.2 of the Plan states: “The Debtors believe that any reasonable estimate, projection or valuation of their total liability and obligation to pay for Claims in Classes 3, 4, 5, 6, 7, 8, 9, 10(a) and 10(b), if they had the ability to pay those Claims outside of these Chapter 11 Cases, exceeds by many multiples the total value of all assets of their Estates, including but not limited to contributions from third parties and the full face value of all of Purdue’s insurance. The Debtors have structured the Plan on the basis of this understanding, and the Confirmation Order shall include a finding consistent with this understanding.”

12. The Ad Hoc Committee retained me to determine whether the position set forth in Section 5.2 of the Plan is accurate.

13. To test the accuracy of Section 5.2 of the Plan, I analyzed the magnitude of the Debtors' liabilities arising out of or in connection with Opioid Claims (i.e., the Minimum Opioid Claim Liability) as compared to the value of the Assets. The question at hand is one of relative magnitude of liabilities versus assets, and the methodology employed addresses that ultimate relationship.

14. To compare the unknown Minimum Opioid Claim Liability to the value of the Assets, I needed to either (a) estimate or (b) bound the Minimum Opioid Claim Liability. Estimating the value of the Minimum Opioid Claim Liability would have involved a level of effort that was unnecessary given that the objective of the Report was solely to test the relative magnitude of the liabilities as compared to the Debtors' available assets. I therefore conducted a bounding analysis through which I set boundaries on the potential value of the Minimum Opioid Claim Liability. This achieved the same objective.

15. To implement a bounding analysis, I started with the understanding, as further described in my Report, that no opioid creditor is likely to do materially better or materially worse than the DOJ with respect to the percentage of recovery on those creditors' unsecured claims under the Plan.

16. This assumption allowed me to conclude that the ratio between the allowed value of the DOJ Unsecured Claims and the amounts payable under the Plan for those claims informs us of the relative sizes of the liability and amounts payable for all Opioid Claims, and therefore allowed me to compute a Minimum Opioid Claim Liability using the following formula: (DOJ

Allowed Claim Value / DOJ Portion of Assets Received) * Assets = Minimum Opioid Claim Liability.

17. The Assets relevant to my analysis are those that are to be distributed or otherwise conferred by the Debtors under the Plan in respect of creditors with Opioid Claims.

18. As further described in my Report, the Assets are comprised of the value of the Debtors' businesses, the amounts contributed under the Shareholder Settlement Agreement in connection with the Plan, the face value of the aggregate limits of liability of the MDT Insurance Policies and the MDT Insurance Collateral, and causes of action against third parties.

19. The Asset value is subject to various adjustments, including those that may result from litigation and settlements over time, and I considered such adjustments in the sensitivity analysis that I utilized in my analysis that serves as the basis for the conclusions in my Report.

20. I understand from Counsel that the total "face value of the aggregate limits of liability of the MDT Insurance Policies and the MDT Insurance Collateral" being transferred under the Plan for the benefit of opioid creditors is \$4.149 billion. Here, as in my Report, "the face value of the aggregate limits of liability" is equivalent to the total of the stated aggregate limits in the policy evidence. I did not conduct any "valuing" analysis of the MDT Insurance Policies and the MDT Insurance Collateral. As discussed in detail in my Report, I did consider a reduction to the value of the insurance to reflect potential litigated outcomes and settlements as part of the sensitivity analysis that I utilized.

21. Also as discussed in detail in my Report, I concluded that under a broad range of circumstances the Minimum Opioid Claim Liability resolved under the Plan exceeds the value of the Assets by many multiples (approximately 100 – 400 times over). In other words, the value of the Debtor's opioid-related liability exceeds the Assets being contributed to fund the Plan

(including the value of the Debtors' business, third-party contributions, and the face value of the Debtors' potentially applicable insurance) by many multiples.

Pursuant to 28 U.S.C. §1746, I hereby declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and recollection.

Executed this 5th day of August, 2021.

A handwritten signature in dark ink, appearing to read "Jessica B. Horewitz", written over a horizontal line.

Jessica B. Horewitz, Ph.D.

EXHIBIT A

Purdue Pharma Liability Analysis

June 24, 2021

	X
In re:	: Chapter 11
	:
PURDUE PHARMA L.P., <i>et al.</i> ,	: Bankruptcy Case No. 19-23649 (RDD)
	:
Debtors.	: (Jointly Administered)
	:



Jessica B. Horewitz, Ph.D.
Senior Vice President
Nathan Associates Inc.

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I. Summary of Findings

My name is Jessica B. Horewitz, Ph.D. I am a Senior Vice President in the Litigation and Expert Services Group, Product Liability and Mass Tort Practice, at Nathan Associates Inc. (“Nathan”), located in Arlington, Virginia.

This report presents my findings in connection with my analysis of certain assets and liabilities involved in the bankruptcy case captioned *In re Purdue Pharma L.P., et al.*, No. 19-23649 (Bankr. S.D.N.Y.). Specifically, I have been retained by the Ad Hoc Committee of Governmental and Other Contingent Litigation Claimants in these bankruptcy proceedings (the “Ad Hoc Committee”) to evaluate the extent to which the liabilities of Debtors arising out of or in connection with Opioid-Related Activities (“Opioid Claims”)¹ exceed the value of the assets being contributed to fund the plan of reorganization and satisfy the Opioid Claims.² Those assets consist of the value of the Debtors’ businesses, amounts contributed by third parties under the Shareholder Settlement Agreement in connection with Fifth Amended Joint Chapter 11 Plan of Reorganization of Purdue Pharma L.P. and Its Affiliated Debtors (the “Plan”),³ rights to proceeds of insurance policies covering Opioid Claims, and causes of action against third parties (collectively, the “Assets”). The purpose of my analysis is to support certain necessary findings for confirmation of the Plan.

To conduct my analysis, I used a known ratio—that is, the ratio between (i) the allowed value of certain unsecured Opioid Claims against the Debtors held by the U.S. Department of Justice (“DOJ”), and (ii) the agreed amounts payable on account of those allowed claims under the Plan—to bound the minimum size of the liabilities of the Debtors arising out of or in connection with all other Opioid Claims (the “Minimum Opioid Claim Liability”). I have concluded that under a broad range of circumstances discussed herein, the Minimum Opioid Claim Liability exceeds the value of the Assets by many multiples.

II. Compensation and Qualifications

As mentioned at the outset, I am a Senior Vice President in the Litigation and Expert Services Group, Product Liability and Mass Tort Practice, at Nathan. Nathan provides analytical and expert services to clients facing complex challenges arising from uncertainty, adverse events, and disputes. Among other specialties, Nathan’s team of economic, technical, and business experts provides its clients, courts, and other tribunals with expert consulting and testimonial support in litigation and arbitration matters through in-depth research, analysis, and quantitative modeling.

For more than twenty-five years, I have used analytical and statistical tools in a variety of settings including bankruptcy, complex damage calculations, economic forecasting,

¹ For purposes of this report, “Opioid Claims” shall refer to Claims in Classes 3, 4, 5, 6, 7, 8, 9, 10(a) and 10(b) under the Plan.

² All capitalized terms herein shall have the meanings ascribed to them in the Fifth Amended Joint Chapter 11 Plan of Reorganization of Purdue Pharma L.P. and Its Affiliated Debtors, unless otherwise noted.

³ Fifth Amended Joint Chapter 11 Plan of Reorganization of Purdue Pharma L.P. and Its Affiliated Debtors (the “Plan”), ECF No. 2982.

statistical analysis, and cash- flow analysis. I have testified in a number of matters, including in damages and insurance coverage matters as detailed in my curriculum vitae, which is attached as Exhibit 1 to this report.

I received my B.A. degree in economics from the George Washington University and my M.A. and Ph.D. degrees in economics from the University of Virginia. I have held faculty appointments at the University of Virginia, Duquesne University, and the George Washington University. I am a volunteer arbitrator and former board member for the District of Columbia Bar Attorney/Client Arbitration Board. In this matter I am being compensated for my time at \$625 per hour.

III. Introduction

A. History of the Engagement

I understand from my review of documents provided by Gilbert LLP, counsel to the Ad Hoc Committee (“Counsel”), that the Debtors are in bankruptcy and that they filed the aforementioned Plan on June 3, 2021. Section 5.2 of the Plan states:

The Debtors believe that any reasonable estimate, projection or valuation of their total liability and obligation to pay for Claims in Classes 3, 4, 5, 6, 7, 8, 9, 10(a) and 10(b), if they had the ability to pay those Claims outside of these Chapter 11 Cases, exceeds by many multiples the total value of all assets of their Estates, including but not limited to contributions from third parties and the full face value of all of Purdue’s insurance. The Debtors have structured the Plan on the basis of this understanding, and the Confirmation Order shall include a finding consistent with this understanding.

In order to test the accuracy of the abovementioned Confirmation Order finding, the Ad Hoc Committee has retained me to analyze the magnitude of the Debtors’ liabilities arising out of or in connection with Opioid Claims (i.e., the Minimum Opioid Claim Liability) as compared to the value of the Assets.

The pertinent facts that inform my analysis include:

- The value of the Assets, which are to be distributed under the Plan to compensate the creditors with Opioid Claims. *See* Section IV.A.1.
- The total number and aggregate value of claims asserted against the Debtors by the Proofs of Claim (“POC”) submitted to the Estate as of the General Bar Date (July 30, 2020) that allege liability arising out of or in connection with Opioid-Related Activities, i.e., the POCs for the Opioid Claims. *See* Section IV.A.2.
- The amounts allowed and payable for DOJ Unsecured Claims under the Plan and pursuant to the terms of the Plea Agreement and Civil Settlement Agreement between the Debtors and DOJ, including the condition of the DOJ Settlement that the

Plan “provides fair and equitable treatment to the United States and does not unfairly discriminate against the United States.” *See* Section IV.A.3.⁴

- My education and experience in forecasting and estimation in product liability and insurance coverage settings. *See* Section II.

Each of these facts are detailed below.

B. Documents and Information Reviewed

In June 2021, Counsel provided Nathan with the following documents and information:

- Plea Agreement (Ex. B to DOJ 9019 Motion) (Dkt. 1828-2) 4824-2333-5647.pdf
- Civil Settlement Agreement (Ex. C to DOJ 9019 Motion) (Dkt. 1828-3) 4830-1093-1423.pdf
- 2020.11.18 [2004] – Order Authorizing and Approving Settlements.pdf
- 2020.10.21 [1828] – Motion of Debtors Authorizing and Approving Settlements.pdf
- 2021.06.02 Doc 2969 – Disclosure Statement for Fifth Am. Plan.pdf
- 2021.06.03 Amended Plan dckt 2982_0.pdf
- Face value of aggregate limits of the MDT Insurance Policies and MDT Insurance Collateral

C. Limitations

The Ad Hoc Committee, through Counsel, supplied me with relevant documents for the limited purpose of performing the calculations herein. I rely upon and assume without independent verification the accuracy and completeness of all information supplied. Should additional materials be made or become available, I reserve the right to revise the opinions put forth in this report.

IV. Methodology

As set forth above, Section 5.2 of the Plan states:

The Debtors believe that any reasonable estimate, projection or valuation of their total liability and obligation to pay for Claims in Classes 3, 4, 5, 6, 7, 8, 9, 10(a) and 10(b), if they had the ability to pay those Claims outside of these Chapter 11 Cases, exceeds by many multiples the total value of all assets of

⁴ We note that a separate DOJ claim—the DOJ Forfeiture Judgment Claim—is also allowed under the Plan as a superpriority administrative expense claim. I do not include this claim in my analysis due to its different priority treatment from other unsecured claims.

their Estates, including but not limited to contributions from third parties and the full face value of all of Purdue's insurance. The Debtors have structured the Plan on the basis of this understanding, and the Confirmation Order shall include a finding consistent with this understanding.

The Ad Hoc Committee has asked Nathan to determine whether the position set forth in Section 5.2 of the Plan is accurate. The question at hand is one of relative magnitude of liabilities versus assets, and the methodology employed addresses that ultimate relationship.

To determine the relative magnitude of liabilities versus assets, I need to look first at which variables are known and which are unknown.

- I know the allowed value of the DOJ Unsecured Claims and the amounts to be paid in satisfaction of those claims under the Plan. *See* Section IV.A.3. The remaining 614,000 POCs for the Opioid Claims do not have an allowed claim value.⁵ I therefore use the agreed DOJ claim treatment to create a calculation that solves for Minimum Opioid Claim Liability. This analysis does not estimate an allowed value for the POCs for the non-DOJ Opioid Claims. Rather, I use the DOJ allowed value as a reference point to calculate the analogous concept of Minimum Opioid Claim Liability.
- I know the value of cash contributions from third parties dedicated under the Plan to compensate the holders of Opioid Claims under the Plan and the expected value of certain other transferred Assets (i.e., the value of the Debtors' business and the face value of certain insurance rights), *see* Section IV.A.1, and can therefore calculate a baseline estimated value of the Assets. I do not know the value of certain other Assets being transferred to certain trusts to benefit holders of Opioid Claims (i.e., certain third-party causes of action). I adjust for those variables and unknowns in my sensitivity analysis.

To compare the unknown Minimum Opioid Claim Liability to the value of the Assets, I must either (a) estimate or (b) bound the Minimum Opioid Claim Liability. Estimating the value of the Minimum Opioid Claim Liability is both beyond the scope of this report and would involve a level of effort that is unnecessary given that the objective of the report is solely to test the relative magnitude of the liabilities as compared to the Debtors' available assets. I therefore conduct a bounding analysis through which I set boundaries on the potential value of the Minimum Opioid Claim Liability. This achieves the same objective.

To implement a bounding analysis, I start with the understanding that no opioid creditor is likely to do materially better or materially worse than the DOJ with respect to the

⁵ Excluding the DOJ Forfeiture Claim, which I am not considering in this analysis for the reasons discussed above.

percentage of recovery on those creditors' unsecured claims under the Plan.⁶ This understanding is based on (1) the terms of the DOJ Civil Settlement Agreement and Plea Agreement under which the Debtors are required to "propose and obtain confirmation of a plan that," among other things, "provides fair and equitable treatment to the United States and does not unfairly discriminate against the United States"; (2) the fact that, as explained to me by Counsel, section 1129(b)(1) of the Bankruptcy Code requires that a plan must not discriminate unfairly, and must be fair and equitable, with respect to each class of claims or interests that is impaired under, and has not accepted, the Plan; and (3) the fact that it is reasonable to assume that creditors generally have a financial interest in maximizing the percentage compensation they receive, and to receive recoveries at least commensurate with those of other creditors.

This assumption allows me to conclude that the ratio between the allowed value of the DOJ Unsecured Claims and the amounts payable under the Plan for those claims (the "DOJ Ratio") informs us of the relative sizes of the liability and amounts payable for all Opioid Claims, and therefore allows me to compute a Minimum Opioid Claim Liability using the following formula:

$$(\text{DOJ Allowed Claim Value} / \text{DOJ Portion of Assets Received}) * \text{Assets} = \text{Minimum Opioid Claim Liability}$$

Once this threshold is established, *see* Section IV.B.1–2, I can examine scenarios and sensitivities to test my conclusions, *see* Section IV.B.3.

A. Facts And Assumptions Relied Upon

1. Assets

The Assets relevant to this analysis are those that are to be distributed or otherwise conferred by the Debtors under the Plan in respect of creditors with Opioid Claims. The Assets are comprised of the following:

- The value of the Debtors' businesses. Pursuant to the Plan, as of the Effective Date, 100% of the assets or equity of the Debtors will be transferred to a newly-created company for the benefit of the holders of Opioid Claims. We assume, based on the Valuation Analysis set forth in the Debtors' Disclosure Statement for the Fifth Am. Joint Chapter 11 Plan of Reorganization of Purdue Pharma L.P. and Its Affiliated Debtors (the "Disclosure Statement"), that "the Valuation Range of the Debtors' businesses, as of an assumed Effective Date of September 30, 2021, is approximately \$1.6 billion to approximately \$2.0 billion (with the mid-point of such range being approximately \$1.8 billion)."⁸ As noted in the Disclosure Statement, that Valuation

⁶ I note that the DOJ relationship that can be used to draw inferences regarding the POC liability is the relationship between the DOJ allowed value and the DOJ paid value. The DOJ asserted value (the parallel information to the POC observed amount) is unnecessary for the purposes herein.

⁷ *See* Civil Settlement Agreement 5, ECF No. 1828-3; Plea Agreement Ex. B, at 5, ECF No. 1828-2.

⁸ *See* Disclosure Statement for the Fifth Am. Joint Chapter 11 Plan of Reorganization of Purdue Pharma L.P. and Its Affiliated Debtors (the "Disclosure Statement"), App. D, at 2, ECF No. 2969.

Range “includes a range of value solely in respect of: (i) the enterprise value of the sum of the parts of the business segments of the Debtors; (ii) the anticipated unrestricted cash on the Debtors’ balance sheet as of September 30, 2021; and (iii) the market value of Debtor’s investments as of March 29, 2021. Third-party sources of value, such as net proceeds realized from shareholder settlement payments or from the rights to insurance policies held by the Debtors, are not included in the Valuation Range or the Valuation Analysis.”⁹

- The amounts contributed under the Shareholder Settlement Agreement in connection with the Plan (the “Sackler Contribution”). Pursuant to the terms of the Plan and the Shareholder Settlement Agreement, the Debtors’ existing shareholders will contribute \$4.275 billion for the benefit of opioid creditors in exchange for certain releases and injunctions.¹⁰
- The face value of the aggregate limits of liability of the MDT Insurance Policies and the MDT Insurance Collateral. Per Counsel, the total face value of aggregate limits of the MDT Insurance Policies and MDT Insurance Collateral being transferred under the Plan for the benefit of opioid creditors is \$4.149 billion.
- Causes of action against third parties. The Debtors’ contribution with respect to Opioid Claims also includes certain estate causes of action (the “MDT Causes of Action”, as defined in the Plan) against third parties. I have not been provided with any valuation of any such MDT Causes of Action, and therefore include this aspect of the Assets only in my sensitivity analysis, see Section IV.B.3.

The Asset value of the shareholder contribution, \$4.275 billion, is fixed and certain in amount. I use this amount as the lower bound of the asset value.¹¹ The remaining Assets substantially increase the total Asset value. As of the time of this report, I consider the baseline estimate of the total Asset value to be \$10.424 billion, which is the Sackler Contribution, plus \$2.0 billion for the value of the Debtors’ business, plus \$4.149 billion associated with the MDT Insurance Policies and the MDT Insurance Collateral. Potential adjustments to this total include either an increase or decrease to the value of the Debtors’ businesses, a reduction to the value of the insurance to reflect potential litigated outcomes and settlements, and an increase to the extent third-party claims result in monetary recovery. Such adjustments are addressed in the sensitivity analysis in Section IV.B.3 below.

One adjustment that I make is to reduce the total Assets by the amount that (as described in Section IV.A.3) will be paid in satisfaction of the DOJ Unsecured Claims upon confirmation of the Plan, or \$30 million, because that amount will not be available in the

⁹ *Id.* at 1. My calculations use the value of the Debtors’ businesses as presented in the Disclosure Statement. Given that the value stated is framed “as of September 30, 2021,” I note that there may be a time value component to that figure. I assume, for the purposes of this analysis, that any present value adjustment would be immaterial.

¹⁰ See Disclosure Statement 152; Plan 34.

¹¹ The lower bound value of the asset is used for sensitivity analysis. It is subject to the adjustment for the \$30 million to be paid for the DOJ Unsecured Claims, as described in Section IV.A.3.

distribution to other holders of Opioid Claims. I do this because, as outlined above and detailed below, I use the DOJ variables to calculate the Minimum Opioid Claim Liability as a whole, and it would be improper to include the same figure in both sides of the calculation.

Given the available data, the analysis value for the Assets for the purposes of the relative magnitude evaluation is a nominal \$10.424 billion, less \$30 million, or \$10.394 billion. I review sensitivities surrounding this assumption in section IV.B.3 below.

2. Liabilities

The liabilities under consideration are captured in the POC filings. According to the Disclosure Statement, over 614,000 POCs alleging liability for Opioid Claims were filed against the Debtors by the July 30, 2020 General Bar Date. While I understand from Counsel that there were additional claims filed after the General Bar Date, it is conservative to consider in my analysis only those filed before that date.

Also as set forth in the Debtors' Disclosure Statement, the aggregate liability alleged in these POCs is more than \$40 trillion (exclusive of one personal injury claim that asserted \$100 trillion in alleged liability).¹² Further, the Disclosure Statement states that approximately 90% of POCs alleging liability for Opioid Claims do not allege a specific amount of liability.

3. Department of Justice

Included in the liabilities are the DOJ Unsecured Claims. I understand from Counsel and my review of the DOJ Settlement Materials that the Debtors' liability in connection with DOJ Unsecured Claims has the following components that are relevant to this report:

- The allowed claim amount: Under the Plan, the total allowed amount of the DOJ Unsecured Claims is \$6.344 billion (comprised of the DOJ Civil Claim of \$2.8 billion and the DOJ Criminal Fine Claim of \$3.544 billion).¹³
- The paid claim amount:¹⁴ Under the Plan, \$50 million will be distributed in satisfaction of all Federal Government Unsecured Claims. The Plan allocates 60% of that amount, or \$30 million, to allowed DOJ Unsecured Claims.¹⁵

It is reasonable to assume that all creditors in a bankruptcy have a financial interest in getting at least a fair share of payment on their claims, which financial interest would cause claimants at least to seek similar distributions. That seems to be confirmed by the terms of the DOJ Settlement, which requires that the Plan "provides fair and equitable treatment to

¹² Disclosure Statement 197.

¹³ Plan § 4.3.

¹⁴ Since Purdue is in bankruptcy and cannot fulfill its obligations to creditors, the face value or "allowed" amount of the claim is reduced by an amount such that the debt can be satisfied by the Debtors, the received amount.

¹⁵ *Id.* The remaining 40%, or \$20 million, is allocated to other Federal Agency Claims, which do not have an allowed amount and are not considered for purposes of establishing the DOJ Ratio. *See id.*

the United States and does not unfairly discriminate against the United States.”¹⁶ Additionally, I have been instructed by Counsel to assume that the Bankruptcy Code requires that a plan must not discriminate unfairly, and must be fair and equitable, with respect to each class of claims or interests that is impaired under, and has not accepted, the Plan. All of this supports the conclusion that, for purposes of my analysis, no creditor will receive a materially different percentage recovery on its unsecured claims under the Plan.

B. Calculations and Implications

As discussed above, in this case, there is one opioid creditor whose unsecured claims have both an allowed and a paid value: the DOJ. Using the ratio derived from these data points, *see* Section IV.B.1, I can extrapolate the Minimum Opioid Claim Liability, *see* Section IV.B.2. I can then test the robustness of my conclusion regarding the Minimum Opioid Claim Liability by varying the variables on which my conclusion was reached, i.e., conducting a sensitivity analysis, *see* Section IV.B.3.

1. DOJ Settlement Calculation

The ratio between the allowed value of the DOJ Unsecured Claims and the amounts payable on account of those allowed claims under the Plan is known. The paid DOJ Unsecured Claims is **0.473%** of the allowed DOJ Unsecured Claims, which was calculated as follows:

DOJ Unsecured Claim allowed amount = \$6.344B

DOJ Unsecured Claim paid amount = \$30M

Paid/allowed = \$30M/\$6.344B = 0.473%

This ratio, 0.473%, indicates that the DOJ is receiving less than half a cent for every dollar in its allowed claim. I now use this relationship and apply it to the remaining opioid creditors.

2. Inference Regarding Minimum Opioid Claim Liability

The hundreds of thousands of POCs cumulatively allege trillions of dollars of potential creditor liability. However, I know that:

- Liability alleged in the POCs likely is greater than the value for which such claims ultimately would be resolved outside of bankruptcy. We know this because the DOJ’s claim was allowed for a lesser amount than alleged in its POC, and I know that no creditor can be treated in a way that is materially different from the DOJ. This also is the typical result of settlements in the tort system (i.e., receiving less than the full scope of alleged damages).

¹⁶ Settlement Agreement 5 (attached as Ex. B to Motion of Debtors Pursuant to 11 U.S.C. § 105 and Fed. R. Bankr. P. 9019 Authorizing and Approving Settlements Between the Debtors and the United States).

- Purdue does not have sufficient assets to pay its liability in full. We know this because, under the Plan, the DOJ will not receive the full allowed amount of its Unsecured Claims, and I understand that no creditor will be treated in a way that is materially different from the DOJ. This also makes sense because generally in a bankruptcy setting the liabilities are greater than assets. In that case, creditors submit claims, and once the debtor is liquidated or reorganized, the creditors receive payment of a fraction of their overall claim. In other words, it typically is a characteristic of bankruptcy that creditors receive a fraction of their amount owed, often pennies on the dollar.

I can begin to bound the Minimum Opioid Claim Liability, excluding the liability for the DOJ Unsecured Claims, using the following assumptions:

- All Assets (at \$10.394 billion, as described above) will be distributed to creditors with Opioid Claims.
- All creditors are treated equally to the DOJ. In other words, all creditors have their claims reduced by the same percentage that the DOJ claim was reduced.

Given these two assumptions, I can calculate the Minimum Opioid Claim Liability:

$$\text{Minimum Opioid Claim Liability} = (\$10.394 \text{ billion}) / 0.473\% = \underline{\underline{\$2.198 \text{ trillion}}}.$$

The DOJ experience (settlement) informs us of the relative sizes of the Minimum Opioid Claim Liability and Assets.

If all creditors with Opioid Claims are treated exactly like the DOJ, the DOJ ratio implies that the Minimum Opioid Claim Liability is more than 200 times the Assets (\$2.2 trillion / \$10.394 billion), a magnitude implied by the size of the DOJ Ratio. In other words, the Minimum Opioid Claim Liability is many multiples of the Assets, as set forth in Section 5.2 of the Plan.

3. Sensitivities

Above I tested the accuracy of whether the Minimum Opioid Claim Liability exceeds by many multiples the Assets by assuming that the Assets are \$10.394 billion and that all creditors received exactly the DOJ Ratio. In this section, I test the robustness of my conclusion by varying the assumptions.

a) Decreasing or Increasing the Value of the Asset

In Section IV.A.1, I noted that the Assets could be as low as \$4.275 billion, less the \$30 million paid in satisfaction of the DOJ Unsecured Claims, or \$4.245 billion. Here, I repeat my calculation using this lower Asset value:

$$\text{Minimum Opioid Claim Liability} = (\$4.245 \text{ billion}) / 0.473\% = \$897.676 \text{ billion}$$

In this case, the Minimum Opioid Claim Liability is again more than 200 times the asset, as implied by the DOJ ratio. In essence, as long as the DOJ ratio holds, the Minimum Opioid Claim Liability will exceed the Assets by many multiples.

If for any reason the Assets were greater than \$10.394 billion (for example when you account for the yet-undetermined value of third party claims), say twice as large at \$20.788 billion, I can recalculate the Minimum Opioid Claim Liability:

$$\text{Minimum Opioid Claim Liability} = (\$20.788 \text{ billion}) / 0.473\% = \$4.396 \text{ trillion}$$

And again, the Minimum Opioid Claim Liability is over 200 times the asset as implied by the DOJ ratio.

In all events that the DOJ Ratio is a constant, the Minimum Opioid Claim Liability will exceed the Asset by more than 200 times no matter the size of the Assets.

b) Varying the DOJ Ratio Such That Other Creditors Receive Slightly More or Less Of Their Claim Than the DOJ

I further noted above that I assume that all creditors are treated *equally* to the DOJ, but this is not necessarily the case. It is possible for creditors to be treated better than and worse than the DOJ, just not materially better or worse.

While I am not opining on the values that “materially” encompasses, I provide two extreme examples for illustrative purposes:

- If all non-DOJ creditors with Opioid Claims were better off than the DOJ with respect to their unsecured Opioid Claims—for example, they received not 0.473 cents on the dollar, but twice that amount, or 0.946 cents on the dollar, the Minimum Opioid Claim Liability would still exceed the Assets by many multiples (over 100 times), and the implied Minimum Opioid Claim Liability would be \$1.099 trillion.

$$\$10.394 \text{ billion} / 0.946\% = \$1.099 \text{ trillion}$$

- If all creditors were worse off than the DOJ—say receiving not 0.473 cents on the dollar, but half that amount, or 0.237 cents on the dollar, Minimum Opioid Claim Liability would still exceed the Assets by many multiples (more than 400 times), and the implied Minimum Opioid Claim Liability would be \$4.396 trillion.

$$\$10.394 \text{ billion} / 0.237\% = \$4.396 \text{ trillion}$$

If the treatment of Opioid Claims other than that asserted by the DOJ varies from the treatment of the DOJ’s claim (i.e., if the DOJ ratio does not apply equally to other Opioid Claims), even to an extreme level, the Minimum Opioid Claim Liability will still exceed the Assets by 100-400 times over.

c) Decreasing or Increasing the Value of the Asset *And* Varying the DOJ Ratio Such That Other Creditors Receive Slightly More or Less Of Their Claim Than the DOJ

If I conduct both of the above sets of sensitivities at the same time, i.e., toggle the low and high values of the asset and extreme deviations from the DOJ Ratio, I can conclude that the Minimum Opioid Claim Liability exceeds the Assets by many multiples (approximately 100-400 times over) under all conditions, as shown in the table below.

Minimum Opioid Claim Liability Scenarios		
	Lower Bound Value of Assets, \$4.275 billion	2x Value of Assets, \$20.788 billion
DOJ Ratio: 0.237%	\$1.795 trillion	\$8.792 trillion
DOJ Ratio: 0.946%	\$448.838 billion	\$2.198 trillion

V. CONCLUSION

I conclude that the Minimum Opioid Claim Liability resolved under the Plan exceeds by many multiples the Assets. This conclusion is consistent with the finding called for in Section 5.2 of the Plan. Further, this finding is robust under various sensitivities. Under conditions equal to the DOJ experience, better than the DOJ experience, and worse than the DOJ experience, and setting the value of the Assets at the lower bound of \$4.275 billion and at twice the Value of the Assets, the Minimum Opioid Claim Liability resolved under the Plan exceeds by many multiples the Assets available to pay the Minimum Opioid Claim Liability.

EXHIBIT 1

NATHAN

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OVERVIEW

Dr. Horewitz, Nathan's practice leader for the Litigation and Expert Services business line, has over 25 years of consulting experience in the litigation environment, using analytical and statistical tools to assist clients with a variety of economic and econometric analyses in different arenas. She has substantial expertise in managing large volumes of data and conceptualizing analyses to best use the data for clients' analytical needs.

Dr. Horewitz has been instrumentally involved in liability estimation, asbestos, pharmaceuticals, and other mass-tort matters. Her experience extends to insurance coverage disputes, bankruptcy/restructure, lost profit analysis, sports economics, and general economic damages analyses. Dr. Horewitz is also experienced in statistical analysis and allocation of environmental remediation costs.

Dr. Horewitz has conducted analyses in a diverse array of industries and has represented clients for the purposes of litigation and settlement in diverse settings such as state court, bankruptcy court, international and domestic arbitration, and governmental and regulatory hearings.

EXPERIENCE

PRODUCT LIABILITY AND INSURANCE COVERAGE

- Retained as consulting expert by dozens of clients in assessing potential asbestos and other product liability for purposes of financial reporting, restructuring, bankruptcy, potential acquisitions, risk walling transactions, due diligence, risk analysis and industry benchmarking.
- Retained as the estimation expert for the futures representative of the THAN trust. Responsible for re-conceptualizing the population of the potential claimant population. Analysis based on US population, mortality, and life-cycle factors.
- Retained as the estimation expert in an opioid-related bankruptcy. Prepared an expert report that evaluated liabilities associated with market share and penetration, insurance, personal injury, state and local damages associated with the sale of opioids for a small manufacturer. Involved in pre-confirmation settlement negotiations that eventually resulted in a pre-confirmation agreement.
- Provided analyses for a pharmaceutical company evaluating a portfolio of potential damages to be used as part of a solvency opinion. Damage categories included federal and state actions, personal injury claims, securities litigation, insurance claims.

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- Retained as consulting expert by a major institution to evaluate liability associated with alleged sex abuse by an employee. Assisted with liability estimation, settlement structure.
- Designed and implemented a model forecasting the total US liabilities associated with exposure to glyphosate (RoundUp).
- Consulting to a major sports league on issues surrounding concussion litigation, settlement structure, insurance coverage.
- Retained as the consulting expert to the futures representative for the Takata airbag trust. Provide quarterly analysis evaluating the claims filed compared to forecasts of future liabilities such that all future claimants are equitably compensated.
- Designed and implemented a forecasting damages model for the lifetime of airbag rupture through the produce and recall lifecycle, instrumental in establishing bankruptcy trust to compensate current and future injured parties.
- Retained by several asbestos bankruptcy trust representatives to review trust performance, metrics, analyze claim filing and resolution behavior.
- Provided rebuttal testimony on the allocation methodology used to compensate damaged parties in a water contamination litigation. Testimony focused on the logical flaws and analytical errors in opposing expert's analysis.
- Provided expert testimony in a product liability transfer dispute regarding the reasonableness of due diligence requests surrounding asbestos for the purposes of the sale/purchase of a chemical company in 1986.
- Provided analysis in implementing tribunal order to re-evaluate financing of an asbestos bankruptcy trust when the initial financial structure was ruled insufficient.
- Provided analysis in a fraudulent conveyance matter by directing research on regulatory status for a portfolio of waste disposal and agricultural chemical sites. Evaluated sites used in probabilistic forecasting of future remediation costs.
- Provided testimony regarding claims database validity and reliability for use in allocation to insurance policies in a pharmaceutical setting. Addressed issues of sample selection, evaluation, and extrapolation, quantification of results.
- Provided testimony on methodology and statistical sampling and extrapolation to apply defense costs to an insurance program in a pharmaceutical litigation under a complex corporate history.
- Provided rebuttal testimony regarding the methodology used to stratify a sample of insurance claim files in a reinsurance dispute. Addressed stratification method, sample selection, extrapolation methodology, and reliability of results.

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- Provided rebuttal testimony regarding the methodology used to value the stock of pending asbestos claims filed by a plaintiff law firm. Addressed adequacy of research, methodology selection, and reliability of results.
- Designed and implemented statistical sampling methodologies to research data issues in claims files and characterize unknown claims based on known distributions and facilitate allocation to insurance policies. Conducted economic and statistical investigations to test assumptions and analyses in insurance coverage disputes.
- Provided expert declaration in an insurance dispute regarding the sample methodology and sample size for reviewing claim files for accuracy.
- Provided rebuttal testimony in an insurance dispute regarding the robustness of statistical results. Addressed the sensitivity of results to assumptions and data “cleaning” performed by plaintiff’s expert. Repeated the statistical analyses under a reasonable data cleaning algorithm and demonstrated how a slight alteration in the assumptions reversed the other expert’s findings.
- Participated in analyses related to environmental contamination sites with limited data for the purpose of estimating future liabilities.
- Evaluated remediation technology choices and probabilistic outcomes for several environmentally damaged sites. Responsibilities included review of engineering reports, alternative remediation selection, cost analysis, writing of summary report.
- Provided analysis for all facets of litigation in products liabilities settings for both insurers and insured. Designed and conducted analysis for liability estimation of pending and future claims in litigation and bankruptcies for asbestos, pharmaceuticals, medical devices, and environmental product liabilities. Modeled cash flow and potential exposed population for expected future liability, reviewed underlying plaintiff files, provided statistical analyses and expertise on large databases and provided expertise and analysis of statistical sampling. Supported experts and attorney/clients in all phases of litigation, including expert report, deposition preparation, trial preparation, and appeal.

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ECONOMIC DAMAGE, ANTITRUST, BUSINESS COMPETITION AND CLASS CERTIFICATION

- Retained as the liability estimation expert for a major institution facing allegations of sexual abuse by an employee. Instrumentally involved in identifying the potentially impacted population, assessing the distribution of potential harm, bounding the liability, structuring a settlement, evaluating analysis from plaintiff and plaintiff experts.
- Provided expert report and testimony on lost revenue analysis associated with a defunct joint venture in the defense contractor industry.
- Responsible for implementation of court order in a joint venture contract dispute. Instrumental in implementation of arbitrator's decision and transition of damage calculation methodology to a neutral party.
- Conducted economic analyses for class certification litigation in a variety of industries, including insurance and retail products, for the purposes of certification, damages calculation, expert rebuttal, and settlement negotiations. Work involved review of large amounts of data and numerous documents and performing market analyses related to anti-trust, tying claims and retail price maintenance.
- Provided support for private and public antitrust actions including authoring sections of expert reports, witness preparation, deposition review and strategy meetings with clients and attorneys. Settings include federal court (trials) and Federal Trade Commission (hearings). Industry experience includes software, chemicals, automotive, oil and gas, and medical equipment.
- In an anti-trust tying class certification matter in the payment card industry, supported liability expert. Responsible for market structure research and analysis, data analysis, framing rebuttal report, database and document management.
- In an antitrust retail price maintenance case, performed data analysis and settlement calculations for potential class member who sought settlement. Educated counsel on method and data restrictions that lead to settlement.
- In engagements involving trademark and patent issues, analyzed the interaction between intellectual property and antitrust, reviewed documents and depositions, framed case theory, authored sections of expert reports, participated in witness preparation, deposition review and strategy meetings with attorneys/client. Industry experience includes telecom, gaming, and trucking.
- Responsible for all data management responsibilities related to a multi-million dollar settlement lost profit litigation, including the timing of data updates, the relationship between several government and non-government sources, interaction

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among programming models, and communication between senior personnel and programmers. Co-wrote procedures manual to document litigation activities and facilitate transition of methodology to a neutral third party.

- Assessed the restructuring of parcel post rates for a competitor of the U.S. Postal Service. Evaluated the re-structuring for issues of cross-subsidization, competitiveness, and predation. Sole support for one witness. Responsibilities included review of opposing party's methodology, framing interrogatory questions and responses, and strategy meetings with client and attorneys.
- Involved in all aspects of litigation support for a major pharmaceutical firm. Evaluated and assisted in sampling protocol for a large national hospital survey. Analyzed results from the sample, including identification and correction for sampling bias. Managed knowledge transfer through periods of staff turnover. Designed and implemented major linking database that incorporates all data used to implement on-going damages model.

TESTIMONY

In Re: Roundup Products Liability Litigation, Ramirez, et al, v Monsanto Co., Case No. 3:19-cv-02224. On behalf of plaintiffs.

- Declaration January 2021

In Re: Indemnification Notice Under Article IX of the Agreement and Plan of Merger Dated October 31, 2017, By And Among PaR Management Group Holdings, LLC, A Delaware Limited Liability Company, PaR System Group, LLC, A Delaware Limited Liability Company (As Successor-In-Interest to PaR Acquisition Sub, Inc., A Delaware Corporation and Mezzanine Management Limited, a Registered Private Company Formed Under the Laws of the Island of Bermuda, In Its Capacity As Representative of Equityholders.

- Affidavit, September 2020

United States Bankruptcy Court Western District of Washington at Tacoma in re: Fraser's Boiler Service, Inc., Debtor on behalf of the debtor:

- Deposition, January 2019
- Expert Report, November 2018

Brandon Freeman, Freddie Vincent, Anika Nicole Lackey, Aminata Tall Plaintiffs v. Delta Airlines, et. al. Defendants on behalf of the plaintiffs:

- Supplemental Report, June 2018
- Expert Report, December 2017

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In the (confidential) matter of an arbitration between: a large leading global/international pharma company and an insurer:

- Expert Report, November 2016
- Expert Report, October 2016

In the (confidential) matter of an arbitration between: a large leading global/international pharma company and an insurer:

- Supplemental Report, November 2016
- Tribunal Testimony (London), March 2016
- Expert Report, January 2016
- Expert Report, December 2015

Syngenta Crop Protection Inc., Plaintiffs, v. Insurance Company of North America et al., Defendants. Docket No. UNN-L-3230-08, on behalf of the plaintiffs:

- Deposition, December 2015
- Expert Report, October 2015

Peggy Keltner, Jerome and Beverly Johnson, Melinda Duniphan and Shelby Sierbert Plaintiffs v. Suncoke Energy, Inc., Gateway Energy & Coke Company, LLC and United States Steel Corporation, Defendants, on behalf of the defendants:

- Expert Declaration, February 2015

In the (confidential) matter of an arbitration between: a large leading global/international pharma company and an insurer:

- Expert Report, February 2015
- Expert Report, December 2014

James V. Raffone and Patricia Raffone on behalf of themselves and all others similarly situated v. First American Title Insurance Company. On behalf of the class:

- Affidavit, January 21, 2014

Truck Insurance Exchange and Mid-Century Insurance Companies v. Calaveras Asbestos Ltd., and Does 1 through 10, Inclusive. On behalf of Calaveras:

- Deposition, October 17, 2013

Continental Insurance Company, Fidelity & Casualty Company of New York, Commercial Insurance Company of Newark, N.J.; Columbia Casualty Company v. Honeywell International Inc., (f/k/a Allied Signal Inc., successor to Bendix Aviation Corporation and Bendix Corporation), et al. (MRS-L-1523-2000). On behalf of Honeywell:

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- Testimony, June 2013
- Expert Report, April 2013
- Expert Report, November 2007

Arrowwood Indemnity Company, Itself and as Successor in Interest v. NGM Insurance Company f/k/a National Grange Mutual Insurance Company. On behalf of Arrowwood:

- Testimony, July 2010
- Deposition, June 2010
- Expert Report, May 2010

McKesson Corporation v. Univar USA, Inc., American Arbitration Association (Case No. 74 489 Y 01220 07JRJ). On behalf of Univar USA, Inc.:

- Deposition, July 2009

Systems Products & Solutions, Inc. v. R4, Inc., United States District Court for the Eastern District of Virginia, Alexandria Division (No. 1:08CV847-TSE/TRJ). On behalf of Systems Products & Solutions:

- Deposition, January 2009
- Expert Report, January 2009

J.T. Thorpe Inc., et al. (Debtor) v. St. Paul Fire and Marine Insurance Company, U.S. Bankruptcy Court, CD California (No. 04-01438). On behalf of insurers:

- Declaration, May 2005

PUBLICATIONS, PRESENTATIONS, AND SPEAKING ENGAGEMENTS

Speaker: Perrin Sexual Abuse Litigation & Coverage Conference. March 18, 2021.

Speaker: Ending Contingent Liabilities Exposure in the Near and Long Terms. Perrin Conferences. January 27, 2021.

Lessons from Asbestos Can Help Resolve Opioid Liabilities, with Marc Scoppettone and Holland Sullivan. *Law360* August 19, 2020. Reprinted in the Associated of Insolvency & Restructuring Advisors Journal.

Speaker: Mass Tort Global Settlement Architecture Conference, May 2, 2019: "Claims Estimation and Data Analytics for Mass Tort Settlements." Perrin Conferences, Washington, DC.

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Speaker: Genetics in Civil Law: Litigation, Regulation, Business Opportunities, and Risks, May 24, 2017: "The Business Case for Creating Opportunities from Knowledge" at The George Washington University

How Emerging Science Intersects with Business, Law and Regulation to Create Risks and Opportunities, April 14-15, 2016, Tempe Arizona. Presenter: Economic Approaches to Quickly Modeling and Using New Information to Manage Change

The Benefits of Probabilistic Cost Analysis for Quantifying Risk in Asbestos-Related Disease Expenses, with Brian Henthorn, Jorge Sirgo, and Kirk Hartley. *Environmental Claims Journal*, November 10, 2015

Speaker: Opening Panel of Perrin's National Asbestos Conference, September 26-28, 2015, San Francisco, CA. Presented data on defendant claims experience trends.

Are Insurers Prepared for a Third Wave? SNL Webinar, February 20, 2014.

A Global View of Mesotheliomas and Asbestos Litigation: Both Are Many Years Away From Peaking When Looking Outside the US, with Kirk Hartley. *Law 360 Product Liability*, April 17, 2012.

A Global View of Mesotheliomas and Asbestos Litigation: Both Are Many Years Away From Peaking When Looking Outside the US, with Kirk Hartley. *Mealey's International Asbestos Liability Report*, February 2012.

Benchmarking for Asbestos Liabilities, with Mary Lyman. *Journal of Run-off and Restructuring*, Issue 29, Summer 2009.

Forecasting Mesothelioma: Improvements in the Nicholson Methodology Are Better Predictors of the Recent Past, with Jorge Sirgo. *John Liner Review*, Vol. 23 No. 1. Spring 2009.

Speaker: Data Analysis, Venue Update, and Strategy Review, *BVR Legal/Mealey's™ Teleconference*, August 5, 2008.

Speaker: Learning from the Data to Chart Out Future Trends and Manage Your Cases, *LexisNexis® Mealey's™ Teleconference*, November 15, 2007.

InTap, December 2005 meeting, Cologne, Germany. Presented summary of analyses from several US consulting firms regarding funding of the Fairness in Asbestos Injury Resolution (FAIR) Act (proposed federal asbestos reform).

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SENIOR VICE PRESIDENT

Analysis of the Estimated Production Cost Savings of Replacing the Dollar Note with the Dollar Coin, with Robin A. Cantor and Robert N. Yerman, final report of analysis submitted to *Congressional Record* June 12, 2000.

Doctoral Dissertation to the Economics Department, University of Virginia, 1997, "Are National Football League Team Owners Profit Maximizers?"

EDUCATION

University of Virginia, Ph.D., M.A. Economics
The George Washington University, B.A. Economics

PROFESSIONAL AFFILIATIONS

American Economic Association
District of Columbia Bar Attorney/Client Arbitration Board

- Board Member 2014-2020, Vice Chair 2016-2018
- Volunteer Arbitrator, Appointed 2006

PREVIOUS EMPLOYMENT

Gnarus Advisors LLC (now part of Nathan Associates Inc.)
Navigant Consulting, Inc.
LECG, LLC
PHB Hagler Bailly (formerly Putnam, Hayes & Bartlett, Inc.)
The George Washington University
Duquesne University
University of Virginia